CHANGES

PRODUCED IN

THE NERVOUS SYSTEM

BY

CIVILIZATION,

CONSIDERED ACCORDING TO THE EVIDENCE OF PHYSIOLOGY AND THE PHILOSOPHY OF HISTORY.

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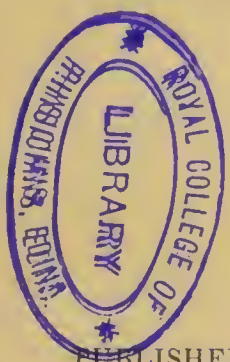

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PREFACE.

The following pages were originally intended as an introductory essay to some views on the Principles of Medicine, considered in relation to the modified type of temperament produced by the increasing proportion of the nervous element in the organization of individuals, who are fair representatives of the high civilization of modern times; but as these introductory pages may be said to contain within themselves a subject of philosophic interest, both to the Historian and Statesman, as well as to the Physician, it has been thought advisable to publish them in a separate form, with the intention, at some subsequent period, of carrying out the more medical part of the work to the extent of the original design.

Paris,
Nov. 1, 1837.

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THE NERVOUS SYSTEM.

I. The highest physiological authorities of modern times agree in maintaining that the General Nervous System is an absolutely necessary condition for the manifestation of the many kinds of activity, animal, moral and intellectual, which take place in the human subject; and it has been regarded with great truth as a characteristic feature of these later times that the superior functions of this system have been universally expressed with a plenitude, extension, and energy hitherto unrecorded in the history of man. It is proposed to show in the following pages, by logical deduction from these grounds, as well as by historical and physical evidence, that there largely obtains a close and invariable parallelism of increase and expansion

between these various activities of the human economy, and their organic physiological conditions; that in proportion as the former become enhanced, so do the latter become developed, and reciprocally; that according as one species of activity more than another predominates in the life of the human individual, so also does the corresponding organic element, subserving this, become in its turn amplified and more appreciable; that individuals, in fact, undergo modification in the constituent tissues of their bodies, according to the particular kind of activity which governs and habitually prevails. In some it will be the animal and organic, from high proportional endowment of the muscular system, visceral organs, and ganglionic nerves; in others, it will be that of a higher kind, and more characteristically human, from the volume and quality of the great nervous centres, the former being fit types of the semi-civilization of more remote times; the latter, types of our own. And from the superior nervous activities eminently characterising our present times, it necessarily follows, that we may expect to find, in all individuals who are fair representatives of the higher type, a predominance of the corresponding organic con-

ditions, over those of lower grade, in the nervous system; that these individuals, in fact, are to be distinguished by marked and important differences, both in the quality and relative proportions of the tissues composing their organization, from those having existed in antecedent epochs of an embryotic and ruder civilization, in which the tastes and habits of society partook much more of organic and animal activity. A clear perception of these differences in all their bearings upon the working of the economy is, indeed, of vital importance in estimating the political and intellectual value of individual men, and of national character, and in rightly appreciating all complicated pathological states of the body; and many mischievous effects must ever have happened from a gross and indiscriminating ignorance on these points, fatally misapprehending the delicate and freely re-acting sympathies of a high-wrought organisation.

II. Having so far taken into consideration the evidence necessary to establish the principle, that there obtains a finer and more abundant endowment of the purely nervous tissues amongst the constituent elements of the human physical constitution, in proportion as civilization advances, the

second part of this essay will be occupied in making application of this truth to the Practice of Medicine. Indeed, when it is considered that, through the nervous system alone, all expressions of activity and suffering, whether mental or organic, can be felt and manifested by organised beings; that this system is super-imposed as a culminating point above all others in the body, and is, as it were, the final and necessary chord upon which all impulsions must strike, to have even an existence, and name for their effects, and to be appreciated by the observing eye of science, it will not be saying too much in advancing that hitherto this element of action has never yet been generally estimated to the full extent it deserves, and according to the high rank which it holds in exalting and wonderfully modifying the form and complexion of all diseases; ever different, however, with regard to the principle of treatment, according to individuality of temperament, or, in other words, according to the quality of the predominating tissue which composes the affected individual. This division of the subject will comprehend the physical and functional characters of the nervous temperament so rapidly increasing at present

amongst the easy and lettered classes of society; the operation and effect of different qualities of diet and hygienic regimen upon the nutrition and development of the chief systems of the body; the balance of action arising from the related state of the circulation to the nervous system, both in health and in disease; and, lastly, the modified treatment of both acute and chronic affections, as a necessary consequence of recognising the existence of the predominating nervous organisation of modern individuals compared with those of former times.*

III. According to the plan just now succinctly laid down, the subject of our inquiry may at once be entered upon by turning towards the side of History. Here we find made out that there prevails a certain principle of progressive development in humanity, in proportion as civilization advances. Of late years this question has been more largely investigated, and certainly with singular success, by several writers on the Principles of Human Nature and the Philosophy of History,—writers of the highest capacity and compass of reflective thought—Vico,† Herder, Condorcet, Lord Kames,

* This, the medical part of the work, it is intended to publish at some future opportunity. (See Preface.)

† The great genius, erudition, and extraordinary powers of

Fred. Schlegel, Gall and Spurzheim, Hegel, and above all, Michelet, the historian; besides some others, whose minds have similarly overcome the narrow limitations affixed by the accidents of locality and time even to the intellectual range of the reflecting portion of mankind. These authorities have satisfactorily demonstrated, from a certain connected order in the succession of historical events, and a long enchained series of data following each other from the infancy of the world to its present age, that the principle of progressive civilization is a law of our nature; and, in conjunction with this outward expression of human activity, they have further recognised and traced out, in the psychological interior of man, the first germ, de-

philosophical analysis, possessed by Vico, have, perhaps, never been surpassed. He was the first generally to refer the various historical actions and ideas of mankind up to their common source in the elemental principles of human nature; and he has a right also, certainly, to the original claim of having demonstrated in a satisfactory manner the development of the first phases of human society according to clear and intelligible laws. If he erred in making all humanity move in an ideal circle, first ascensive, then descensive, it was rather because he lived before modern civilization had fairly transcended historic antiquity, and that so early as the 16th century there was in existence no conclusive evidence to establish the principle of progression.

velopment, and, at last, abiding prevalence of the higher faculties and attributes, which constitute the foundation-rock and Christian basis on which all rational hopes must ever depend, that no fresh retrogression into barbarism will signalise the future history of the world; as long as, indeed, safe from the disturbance of cataclysmic revolutions, it remains existent under the form of its present creation. Some of these writers, it is well known, as Herder, have laid more stress upon the influence of accidental locality and external circumstances on the formation of the character of society, which others, as Vico, have attempted, on the contrary, to refer exclusively to an absolute principle residing in the interior of human nature; whilst others, as Kames, Gall and Spurzheim, with more comprehensiveness and right, have maintained the reciprocal action of both these elements of influence one upon the other; each converging towards the same centre and end—the extension of the principles of human activity. These opinions, however, are but different aspects of the same truth. With the remarkable exception of the last mentioned, nearly all these writers have limited the end of their endeavours to the abstract establishment of the

principle of progression, according to but one species of evidence, and to but one point of view—the historical. To this one and circumscribed element of the question they completely confined their views; here they stopped short in their inquiries, separating themselves from the physical part of the investigation, and scarcely at all suspecting the extent and magnitude of corresponding changes and additions taking place contemporaneously in the interior of the nervous structures. Of all these labours, however, the consideration of the present subject has indispensable need, for, when physiologically interpreted, they constitute an essential feature in the unbroken circle of evidence to be adduced in support of our chief argument and position. But this physiological interpretation has never yet been given so formally, and on so broad a scale, as to have become a generalised principle of science, applicable at all times for appreciating the connexion between modifications in the habits, tastes, and progress of human society, and those in the disposition, form, and quality of the general physical organisation. Both these kinds of modification are mutually reflected in each other. This next step further in causation, the present advanced state of science admits of being made.

IV. Indeed, if hitherto, merely from the sources open to the efforts of literary genius, mankind in general have been thus shown to be undergoing progressive modifications in an onward course, it may be regarded now as the peculiar office of the physiologist to demonstrate how at that very same time, throughout centuries of duration, the formative nutrition was silently at work in modifying also interiorly, according to certain organic laws, the physical man; in enlarging particularly the boundaries of the primitive nervous structures into more perfect outlines of proportion and form; in building up, as it were, *pari passu*, with every new appearance of rudimental improvement its necessary material conditions in the human economy. Without this there would be no imaginable means of realising the successive additions of civilized activity, and of transmitting therefrom enhancement of the natural aptitudes and capabilities to posterity. All would be shifting sand, and we should tread upon no substance which had a resting place upon the known laws of science. (Vide Notes, Nos. 2 and 3.) For the physiologist, every species of activity must reflect itself upon some related organisation. What the purely literary writers

have hitherto seen and put forth, is, to him, a circumstance of effect—a classification of results only; and, indeed, things could scarcely have happened otherwise, for it absolutely requires the full co-operation of the more positive physical sciences to trace these results to the very focus of their causative conditions—the nervous apparatus; and thus to build the bridge by means of which is performed that impregnable circuit of operations ever taking place between the physical and moral organisation of man.

V. For when a cause comes to be drawn out into a prodigal creation of effects, it takes up at once a much more palpable shape, and presents evidence of its own self of such breadth and material extension as to be resisted with difficulty by the mind. The causative power, consummating itself in act, makes a much fuller and more impressive display of its presence; and this it is which gives such force and penetrating reality to the principles and truths obtained by the inductive process, where, by fetching a wide compass of research, effects, from being radiated on all sides over a visible extent of ground, become gathered together to one common centre by the converg-

ing power of generalisation. In the subject at present under our handling, from the expressions of effect having stood out more prominently to the eye, and being more diversified in feature than the unobtrusive material conditions of their existence, it has happened, that the former alone, from this more sensible form of manifestation, have hitherto received universal notice and consideration. Phenomena alone have been recognised separated from their chief causative condition in the organisation. History has largely recorded the character and progress of the human individual, and the actions and vicissitudes of nations—phenomena of effect, however, to which physiology is now prepared to affix concurrent relations in the living structure; so that the physical man will be found ever to be a material monument of the historical, supposing each parallel taken from the same level, and from its appropriate standard type. One should move and be reflected in the other. The former (the physical) would in this way be inferred in all his gradations of change and transformation, from a knowledge of his habits, pursuits, and actions, as pourtrayed in history. Successive pictures of human society, therefore, in

its broad masses of character, from the wretched existence of the stupid Orinoco savage to our own mighty civilization, would, if properly interpreted, be made to disclose the corresponding physiological states and relations, and would become conclusive evidence of the progressive evolution of a higher character of organisation, such as it is the object of this essay to demonstrate. And, in like manner, the same method of inquiry might be pursued with regard to the history of human thought and ideas, from man's first limited range of perception —from his dark and mutilated intuitions of fear, to his magnificent intellectual position at present; all which, if judged by a correct metaphysical analysis, might be resolved into the elemental principles of mind. It would be the method of outward experience, by induction, antithetical to the old one of individual consciousness. Arrived at this point in our inquiry, we might observe, first appearing upon the scene of human activity, the nascent influence of the several faculties, each, as progressively developed, rising higher in the psychological scale, and contributing its part rightly to interpret external nature and the loftier moral relations of humanity. And surely it is looking from a height

of commanding eminence to have already comprehended the laws of the sidereal universe, the secondary causes of our own creation, and to have caught up, as it were, within our own hand, the many subtle and invisible agencies which latently interpenetrate the atoms of all matter, and which fill the secrecies and inaccessible depths of nature with formative life and an intelligible order of procedure; and thus to repel away to a harmless distance the surging masses of cloud and darkness which ever follow with the movement of the moral as of the physical world. All this elevated species of activity must necessarily involve the development of its related conditions in the nervous system, and forms the last addition to the great circle of evidence, which, estimated by physiological principles, will give irrefragable proof, to every philosophic mind, of the harmonious and combined evolution of the physical and moral organisation in the human individual.

VI. The great nations of antiquity, viewed in their whole at this distance of time, and judged by the fulness of our modern standard, all present a very circumscribed and individual character of activity. When the original bias and ruling pas-

sion, under which they shaped out their career from beginning to end, came to be expended, and declined in its energy from the very accomplishment of its object; when the tension and pressure of this spring relaxed and let go its hold and force, the life and unity of their political movement became defunct also, and departed, leaving the whole fabric to fall by its own weight and internal decay. The periods in which the empires of old sprang up, shone in the ascendant, and attained to their partial civilization, seem of short duration compared with the slow, oak-like growth of that of modern nations. They would appear like forced and imperfect creations, shooting up rankly and luxuriantly for a time, but prepared soon to break down and decline from drawing their supply of nourishment out of a range of elements too restricted to afford a continuance of excitement and health. It was a partial and unequal activity, where a few of the powers of human nature absorbed the rest, giving over-nutrition to some parts, atrophy to others. Wanting integrity and harmony of parts, they became, so to speak, aborted civilizations; as if the formative power, arrived at its crisis of maturation, was unable, from

some deficiency in the constituent elements, to throw out a principle of strength and progression. Hence they sunk down, under this arrest of development, into a stagnant and corrupting mass, stirred up into new and vigorous life only by the transfusion of the active and fermenting qualities brought at various times by the migrations of the different northern nations. Thus the soft and effeminate civilization of the Indian and the earlier Asiatic empires, receiving into its bosom the fierce irruptions of the Tartar and Caucasian races, regerminated anew, with greater vigour and expansion, and later in time, the decomposed and burnt-out spirit of the Greek character, without masculine intellect, public principle, or moral will, gave way to, and became absorbed in, the robust and energetic qualities of the rude people of Macedon—an amalgamation fatal indeed to the barbaric refinement and worthless satrapies of the Great King, but, on the other hand, highly favourable to the progress and diffusion of science and civilization amongst the nations of the then known world. It may indeed be considered as a general law, that in proportion as the grander kinds of activity shrink up and retire within narrower and

obstructed channels, so, physiologically speaking, in the same ratio does absorption and disintegration of the corresponding material structures take place; and parts of the nervous economy, which originally were pulsating high with life and power, become, in a great measure, obliterated by continued inaction in a few successive generations. Every additional degree of delicacy and refinement given by the arts of civilization to the physical temperament of a race, unless worked out and sustained by proportional intellectual advancement and moral energy, ends at last by emasculating its character, and then it breaks down under the pressure of the first invading force from without.* There is no principle of stability, either physical or moral, in such a people. This has hitherto been the sole history and fate of nations. It has never been found in history, that it was difficult for the animal powers to become less and more mitigated in their expression, but the difficulty has

* In the savage state, says Lord Kames, man is almost all body, with a very small proportion of mind. In the maturity of civil society, he is complete both in mind and body. In a state of degeneracy by luxury and voluptuousness, he has neither mind nor body.—Book i., Sk. viii.

been for the higher powers to become developed equal to the sustainment of continuous civilization. It is not enough to let the former be effaced by inaction, to die of an atrophy, but their activity must be replaced by positive development of intelligence, by something pregnant with prospective advancement.—But the last northern migrations, which took place in the first centuries of the Christian era, from their magnitude and duration, and the form and complexion they have impressed on our European world, demand a more marked attention, as well as a more detailed analysis of the physiological development of the kind of society into which they settled down. Such seems the advance and position of human affairs at present, that, perhaps, it may emphatically be said, these northern migrations are, indeed, to be the last. It is difficult to contemplate an historical spectacle of more grandeur and importance than the movement of so many races and nations adventurously precipitating themselves upon the entire face of the old civilized world—careering to and fro all around the circuit of the Mediterranean shores, as if fetched out of unknown regions, and guided by an Almighty hand, to accomplish a

salutary, settled purpose in the destinies of mankind. For upon this great event the fortunes of the human race have turned. It was the collision and intermixture, one with the other, of the many and various elemental powers of human society, qualities of blood and of character, languages and institutions, which subsequently gave birth to new and more vigorous forms of social life. For, from this transfusion of so many native and untainted elements into the languishing and dying current of Roman civilization, cemented together and controlled by the commingling influence of the Christian principles, was formed the general European stock, which has divided itself into the different nations of modern times, having, however, from the similar circumstances of their origin, many characteristics in common. It was an amalgamation of that astute, selfish, and indomitable will of the old Roman—that practised and well-balanced understanding in political matters, with the rich intellectual freshness and more generous and loftier moral energy peculiar to the Teutonic and Scandinavian races; and, in a physiological point of view, we must never forget that these distinctive classes of qualities, with many others arising from

greatly different organic temperaments, were equally reflected in the tissues and structures of the physical body. Where the admixture partook more fairly of the different elements, the fusion has taken place more rapidly and with more thorough effect; the fermentation and final adsettlement (so to speak) was sooner completed, and there has been evolved from the inward and amalgamating action, a more perfect and compact unity of national character; and it will be found that the political and domestic institutions of a nation, as it approached this type, will have become the sooner mature, vigorous, and progressive. But where the physiological and moral elements of these different races have entered into partial and unequal combinations—where the races have remained in too pure and unmixed a condition, we shall observe the resulting compounds more faulty, and of too special and narrow a kind; there shall we see a limited and monotonous activity, a weakness and insufficiency of the elaborating principle of civilization and progression, an unbalanced and one-sided march, a tendency more to individuality of action than to that harmonious, free, and catholic development thrown out on all sides

from the common centre—from the perfect and healthy germ which contains in due proportion all the elements of humanity.*

VII. From the first general establishment of the feudal system in Europe to the period of our own times, we possess an authentic record of an unbroken succession of historical phenomena and events, with their causes and dependencies—of pictures and representations of the interior working of society, throughout the different intervening ages, in its tastes, pursuits, manners, and usages; forming an ample store of rich and varied materials, to trace out, as by unerring landmarks, the sphere of action and the progress of civilization from the one point of state, the political unit of feudal sovereignty, to that diffused share and participation of position and influence, wrung from the mailed hand of power, by new antagonists and comers-on-the-scene—the general moral will and intelligence of society. It comes thus within our power, curiously to detect civilization emerging gradually from its first almost buried sources, then to see its course nobly swelling out from beneath the load and obstruction of sheer animal will, into

* Vide Note 1.

its present broad and majestic stream; and to appreciate besides the magnitude and character of effect given by the confluence of each new and successive element of human activity, as soon as it discovered itself in act to the notice of history under an outward and distinctive form. Our immediate object at present is to follow out, by applying known principles of science to judge this species of evidence, the history of the progressive physiological development of society by the side and by the light of civil history; to infer, in short, that a certain physical evolution in the nervous system is produced correlatively with each successive step in civilization.

VIII. In the first periods of pure feudalism the circle of human life and of human actions was very circumscribed. A restless instinct for aggression and war, for feats of arms, for rapine and marauding expeditions; an attitude of defiance and hostility towards bordering nations, and a spirit of feud between the nearest territorial possessors; the pleasures of the chase, and a grossness of indulgence in the coarser appetites, comprehended pretty nearly the whole activity of society in those times; and all this was encouraged also by the peculiar

tenure and working of the feudal institutions. It was their reflection in an active and practical shape; their very life, indeed. A fierce and ruling animal Will, acting upon a deep substratum of muscular activity, stood thus out as the most prominent physiological characteristic of this age. The higher kinds of nervous function were overborne and swallowed up by the inferior. The chief organic nutrition seemed to go to the sustenance of the muscular system, that being alone the peculiar apparatus through which the coarser animal instincts find vent for their activity, and are carried out to act upon the external world. This circumstance, considered with the preponderating functions of the visceral organs, the vascular tissues, the whole system of ganglionic nerves, and the lower grade of the cerebral formations, made up a body of animal energy which habitually predominated and bore sway over the nobler parts of the nervous economy. These latter seemed scarcely to have had a manifested and appreciable existence. They were not to be seen amongst the elements concerned in forming the social character and constitution of the period. They were living in a kind of embryotic abeyance, folded up in a

rudimental shape. All, therefore, was "dark" and barbarous. Man owes his dignity and superiority to the full measure and unabated integrity of his nervous system—to the sovereignty of will and of intellect. In a mere philosophic point of view, it is a matter of exceeding interest to contemplate the long and assured control by which Mind alone coerced the world of brute force throughout this barbarous and first phase of modern society—a proud and legitimate prerogative; to see how creatures of colossal growth, of sinew and atlantean strength, clad in steel and mail—the formidable men-at-arms—could be struck down and turned aside, as mere children, by the thunderbolts of intelligence and moral volition, wielded by those stern pale-faced churchmen of old, with their dry, spare bodies, their thin compressed lips and spacious thought-worn foreheads, all chiselled out of the intellectual cast of temperament; being by anticipation of time, as it were, individual approximations to the modern type, just as their feudal contemporaries might be said to partake of the same stuff and moulding as our obtuse-minded and ponderous-limbed rustic population.

IX. The first amelioration of the feudal type

came from the Crusades. It is not difficult to conceive how an excitement and fermentation of the general mind, propagated for a series of times by authority and the eloquence of holy enthusiasts from one end of Europe to the other, should violently have reacted throughout the entire elements of society, calling into marked and influential existence a higher character of nervous function, and, as a necessary consequence, increased nutrition and development in its related cerebral organisation. It was a new leaven cast into the heavy feudal mass—a new principle vivifying into some kind of fruition and good that plenitude of animal energy ever prevalent in the first infancy of nations. It is curious to remark, that the appeal made the most powerful impression on the Germanic races in England, France, and Germany—countries, where still at this day prevail the same distinguished moral and physiological peculiarities as must have more faintly characterised the original type during the ages of the Crusades. The influence and effects of the new ideas must, indeed, have been deep and universal, penetrating to the very heart and core of the masses, to have brought forth the emphatic and

famous saying of Anna Comnena—"the whole of Europe seemed precipitated upon Asia." The Crusades may be said to have effected interiorly almost as thorough and as extensive a moral revolution in the structure of European society as did the northern migrations, several centuries back, in an outward and physical point of view. They afforded an opportune vent and drain to the growing and troublesome excess of that hot-blooded spirit of domestic aggression and violence; and by joining the crosier with the sword, brought the latter nearer to the ways of civilization. This influx upon the feudal type of new ideas and of new hopes, together with the breadth and enterprise of thought inseparable from the aspect of new countries, from intercourse or collision with different races and new forms of life, and lastly, the enthusiasm springing from the motives of action being of a more disinterested and higher order than had hitherto stimulated the general will, and urged on, too, by all the power of church and state, made a wonderful modification, after their long season of maturation, in the mere physical activity of the preceding times; but, as no human manifestation whatever can be allowed to take place without

also its material conditions in the body, the physiologist knows well that the nervous system must have felt the influence of the general impulse and movement to the same full and equal degree as the historical evidence extends, and that the corresponding parts of the great nervous centres, from having been directly excited by this newly-created and additional activity for many generations, must have taken up, by successive accumulations of nutrition, an amplified form and size, permanently fixed in the organisation, transmissible from parent to child, and forming, in short, an important step towards an improved character of type. The appearance of every new element of activity in the history of a race must ever be, to the physiologist, evidence of something added or modified in the nervous system. There is a rigid concatenation between the two circumstances.

X. The next step in the enhancement of the human physical type proceeded from the institutions and practice of chivalry. The long discipline and subordination, the necessity of merit before attainment, the estimation of high valour before desire of life, the loyalty to beauty and unprotected virtue, the feudal deference to superiority of grade

and station, the fine and polished sense of personal honour and dignity, and the love of noble and generous deeds, were all circumstances which perpetually educated the society of that period to a standard of thought and conduct, above what it had hitherto known, and which originated spontaneously within its own bosom. Men became thereby weaned and taken away from the grosser kinds of activity inherited with the comparatively lower physical organisation of their ancestors. A new and more powerful moral will now controlled the naked instincts of the former periods. The great names of Bayard, and the Black Prince come, indeed, within this mitigated change of type, but it must not be forgotten that the whole substance of human life was still spent in mere physical activity, and the sword still remained the chief characterising symbol of the epoch. They were truly the Middle Ages, being the half-advance between the unrelieved darkness of pure feudalism and the enlightenment of modern times. No intellectual principle was yet generally at work within the organic mass. The light Provençal literature, the heroic ballad, and the poetry of the Niebelungen and the Minnesängers, indeed, alone cast a

faint hue over the immoveable materiality of society, as it then existed. There was yet but little evidence of inward progress in the higher intellectual combinations expressing itself in the form, construction, and unity of language. We find mention in history that a few great men* now began at distant intervals to stand up before their time propounding truths and principles in Natural and Moral Philosophy beyond the comprehension of their contemporaries. They were minds belonging rather to the fulness of the future, shining for a while, as solitary lights, to sink again in the universal gloom around them. But they did not waste in vain as "ineffectual fires." There is little doubt but that these possessed all the physiological characters of the enhanced intellectual type of succeeding times, being thrown out by a happy concurrence of the formative conditions, as forerunners of what society in general was to be in after ages. They might be said to be not so much fellow-denizens of those living in their own times, as contemporaries in thought and opinion with those born centuries after them. They enjoyed the privilege of being upon a level with the high

* Roger Bacon, Wickliffe, Galileo, &c.

intelligence and civilization developed in after times, and still developing itself, at present; and they must be taken, not as patterns of the qualities and wisdom of our ancestors, but rather as men having mirrored out within their luminous and prophetic minds a reflection of modern times. They went as much beyond our ancestors as many living individuals at present anticipate within their own selves the progressive changes to be evolved under the next steps of civilization and intellectual progress.

XI. In the historical picture succeeding the ages of chivalry the ameliorative activity of society advanced, in all ways, with more breadth, rapidity, and power, and in a higher ratio than formerly. There flashed out of its dark surface a brighter display of light and phenomenal effect; the scene was more replete with life and active agency, and there were certainly disclosed to view, and thrown out, from the interior of human nature, more vigorous shoots of intellectual growth, and a much more adventurous will after truth, and the ways of knowledge, of enterprise and of power. A new principle seemed to have worked itself out into noticeable existence, and to be cast freely upon the world to dare what it would. The scanty current

of civilization which had flowed almost unseen under the darkness of the feudal ages, had now accumulated into a broad expanse of living waters, which, taken at the flood, were fearlessly navigated by the foremost pilots of humanity, guided by a kind of destiny and the noble instinct of genius. At this stage of the physiological type, the amplification of nervous development, from the steadily increasing depositions of nutrition, must have generally marked itself by a bolder configuration in the higher-related cerebral structures. Out of this fuller maturation and advance of the general mind proceeded the invention of Printing and discovery of the New World, events whose reactive influence still go on and will continue coevally with the duration of mankind. What the one availed to the intellectual world the other did to material space. This period might be considered as a middle point in time whence to contemplate how the small circles of preceding civilizations successively enlarged their sphere of action and geographical extent, until at last the globe itself became encompassed. This concentric enlargement of civilized activity into greater and greater circles may be traced out, beginning from the elevated

plateau of central Asia—the historical *officina gentium* of primeval times—through the first Asiatic, Græco-Macedonian, and Roman empires, down to the great Christian confederacy of nations throughout the Old and New worlds; the last circle ever transcending the preceding, both as to extent of space and accumulation of civilization. About this period, too, began those maritime expeditions and frequent emigrations of people to new countries, terminating in the vast system of European settlement and colonisation, through which the commanding points of the habitable globe became affiliated to the civilization of the Christian commonwealth. This commingling and interaction of different races and communities, one with the other, whether by positive admixture of blood, or by the reflected influence of language, thought, and ideas, would appear to be the great fundamental principle and tendency of humanity, whereby the world shall become at last the one city of God, as anciently intimated, through moral analogy alone, by St. Augustin.* The great thinkers of antiquity were comparatively locked up in a prison-house of geographical knowledge, against whose dark walls

* De Civitate Dei.

how many have broken their strength, and how many noble ambitions have fallen ! It is curious to observe how their restless and inquisitive minds were filled with impatience and vain imaginings at this ignorance of the earth's problem. They seemed impressed intuitively that they had a right to know it, and that they were being defrauded of something legitimately allowed to the apprehension of human capacity. The European mind, too, it must be fully recollected, before this period, dwelt habitually within a narrow circumscription of locality. No pinion had ever yet crossed the dark horizon until Columbus sailed. So nearly bordering upon our own times has it happened only to the species to become acquainted with that portion of the earth's surface left uncovered by the waters of the ocean—to survey, in its whole extent, the theatre of their existence and their unconquerable activity. This circumstance may be said to mark a great epoch in the history of human progress, and affords of itself alone, in a material and emphatic shape, a most significant refutation, that society had been stationary and was without a foresettled end in the future.

XII. Hitherto had the intellect of the species

served under the yoke of their more animal instincts and their more personal will, passively obeying the stimulus of a lower order of tastes and desires, such as invariably characterise the earlier times of unaccomplished civilization; but it was now approaching a period of adolescence in which it had grown stout enough to become disenthralled from its ignoble bondage, and to achieve an independent rule and criterion of its own, pursuing, in alliance with moral right, a course with truth and knowledge as the end of its activity. It lost its former subordinate position, and assumed its natural superiority over the whole province of human objects and relations. For the first time it now aspired to original principles, and powerfully stimulated the animal and moral will to have them realised and established in form and practice. From a passive state of tutelage, it began to take up and act upon the rights and prerogatives of a more responsible age. The many ties and swathings of ecclesiastical policy in which the whole of European society had been enveloped with more than Egyptian care, and by means of which the Church had for ages coerced the nations with adamantine power, were the first, because the nearest and most galling, to feel its

emancipated force, and be violently rent asunder. Hence Luther and the crisis of the Reformation. It was one mode only in which the intellectual will, newly developed, demonstrated itself in operation. The clumsy fetters of the old feudal institutions, held together, as it were, for a while by the unity of regal despotism, came next to receive the brunt of its aggressive advancement. Hence the political revolutions and social modifications of this humanitary phase, from our own and that of the last century to those in accomplishment at present, and others silently preparing in the interior of the moral organisation of the more civilized communities of the world. From this period may be rightly dated back the beginning of that war of principles and enlightened opinions against the *vis inertiæ* and antagonising conservatism of every less advanced preceding civilization—a struggle ever taking place in present time between the retrospective and consummated traditions of the old Past and the hopes and intellectual expectations of the new Future. The old civilization ever lags behind the new. And if to the historic eye there should appear at times some interval of pause in the operation of this law of humanity, it must

be, that the powers of human nature in general, like those of the individual, exhausted, as it were, by the process of contested development, were resting for a while to recover themselves, but only to resume their course afterwards with more collected will and with still greater effect. During this epoch the whole extent of European society was violently agitated with the inward working of the new ferment, and after a transition state, troubled by frequent collisions of moral and physical force, threw out at various times, with amazing fecundity, those clustered groups of native intellectual talent—our present wonder and admiration—in philosophy, in science, in poetry, in polemical divinity, in general literature, in the fine arts, and in short, in every department of human knowledge, where activity of mind, incorporating itself with fresh and virgin materials, could give birth to new creations and new forms of being. Where the darkness of Old Night had for ever brooded, a serene firmament now stretched out. The animalism of the feudal and semi-barbarous ages rapidly withdrew, and a much nearer approach was made to the modern intellectual type.

XIII. If it has been shown that civilization in

intellectual and social advancement has hitherto taken place throughout a series of progressive stages, beginning from the first wild and untutored condition of barbarism—each stage, at the same time, rising above its predecessor with a higher character and greater extent of nervous function, in no one part of the historical picture will this ratio of progressive development appear more conspicuous than that representing the amazing stir and activity of the last half-century and of our own times. Within this period only has the connected circle of the physical sciences been brought into a philosophic form of existence and pursued under extensive and systematic induction, and the most momentous truths and principles of the natural world discovered thereby. Within this recent period only has the formation and structure of the earth been geologically investigated, and in its bosom detected the successive gradations of enhancement in the constitution of preceding creations in relation to a similarly ascending scale of animated beings. Thus recently only have we arrived at such a knowledge of the structure and physiology of the vegetable and animal creations, that, comparatively surveyed, they have been dis-

tributed into classification according to certain natural analogies, and have been made to afford demonstrative proof of that beautiful unity of organisation and general conception presiding over the ranges of all organic nature; and it is within our own times that those occult essences and active principles have been extracted, by chemical art, out of the vegetable kingdom, at present, indeed, vulgar articles of use and commerce, but which, not very remotely, were as the dreams of Rosicrucian mysticists and the despair of alchemy. Within this period only have we discovered so largely, by analysis and experiment, the simple elemental constituents of organic and inorganic bodies, the affinities of the atomic world, the proportion and secret forms under which the ultimate molecules of all matter are variously combined, and the higher laws which govern the imponderable, resistless, and subtle agencies of the material universe. Never till lately, too, has there been made so perfect and so universal an application of the physical sciences to the arts and industries of life; developing an amplification of productive power sufficient to modify the whole internal economy of nations, and annihilating, in a great measure, with

regard to intercourse, the hitherto invincible obstructions of time and space. Within this period, too, have those great discoveries been made in the physiology of the nervous system, by which its various functions have been severally assigned to their respective organic seats in the cerebral centres, by which, in short, every human manifestation is accounted to take place necessarily through the instrumentality of determinate material conditions in the body—a localisation of nervous function now apprehended as a fundamental axiom of science by all philosophic physiologists. It is now only the highest problems in psychology, that bear on divinity, and political, moral and intellectual science, are becoming ripe for clear solution; and it is a new and characteristic feature of our own times only, to have the estate of the public press organised on so wonderful and gigantic a scale throughout the more civilized communities of the world, that the general knowledge and opinions of the species become diffused co-extensively with their production, and by far too rapidly for the powers of any single individual. Never hitherto have international communications

with all the climates of the world become so multiplied, frequent, and universal in the relations of commerce, in the interchange of intelligence, of customs and of usages; and ships are sent now to fetch the circuit of the earth with less concern and preparation than our ancestors made formerly to encounter the journey of a hundred miles. And, lastly, within this late period only has early training and systematic intellectual culture been concentrated to act more prominently upon the development of the susceptible nervous system of the child, throughout the greater part of the general European population, and the young mind subjected to feel continually the stimulus of education and of its position working upon the higher faculties and within the whole tissue of its constitution; and so largely, of late years, has the general mind, thus enlightened, participated and lived in the restless operation of literary, social, and political influences, and society of all classes improved in the liberal-mindedness and humanised tastes given by civilization, that even the multitude are much less to be denominated now "a monstrosity more prodigious than hydra," or "that great enemy of reason, virtue, and religion," as in old times, than to be con-

sidered resembling "the reasonable creatures of God."*

XIV. All this brief survey is offered as historical evidence of the progressing activity of the higher qualities of the human mind, and of the nervous functions progressively rising to their legitimate predominance in the human body. We are all carried along with the common movement of humanity as with that of the physical world, and it is not surprising, therefore, that it has been difficult to mark its progress and to measure its velocity. We now stop abruptly with the last footsteps of time, knowing well, there is infinitely more indeed to be discovered and to take place in the ages to come; that knowledge will give mankind an ever increasing power over the physical agencies of nature, and that the truths of the higher intellectual and moral ranges will go on being progressively surmounted, and will ever react favourably upon the character and destination of human society. From the course of the past, and the undeveloped capabilities and tendency of the present, it requires no prophetic mind to deduce the glorious fortunes of the future.

* Sir Thomas Browne.

XV. Attendant upon all these progressive stages of civilization, there took place, simultaneously, and in an equal ratio, great modifications in the character and mode of alimentation amongst society, and in the various hygienic relations which the human individual preserves towards the numerous physical agents which act upon his general functions, material well-being, and physiological development. The grossness of taste, and excess of food, indulged in by all classes, during the ruder ages, presents an immediate and instructive contrast to the delicacy and refinement in diet arrived at by the refined classes of modern nations. Indeed, to have had formerly but the naked necessaries of existence, and scarcely adequate protection against natural inclemencies of all kinds, ever at war with organic life, must be considered a world's remove from the comforts, conveniences, and luxuries which so abundantly minister to the personal and household relations of our present civilization, and which seem ever to extend themselves with the progress of intelligence and industry. Such habits, and such a manner of living as just stated, prevailing throughout society in the early periods, necessarily imply the existence, in

the individual man, of an excessive proportion of animal habitude and function, characterised by the large trunk and limbs, and the relatively small head; by the hard and coarse-grained quality of the bodily material; by the sparing diffusion of nervous fibre in the general textures; and by a preponderance of the vascular, fibrous, and lymphatic systems; forming, altogether, a type of organisation, fit only to engender the extremes of mental sloth, and of undefecated physical activity.* But in proportion as the nervous functions went on developing themselves with civilization, so did alimentation become more regulated, varied, and refined, and the nutritive processes influenced to take up corresponding modifications, both as to their seat, their character, and their activity. For it is a physiological law that that system of the human economy which predominates disproportionately, and which is, besides, habitually exercised, draws to itself a greater afflux from the general store of nourishment, which, by an assimilative nutrition, it converts to fresh depositions of material analogous to its own substance and nature. Each part of the body thus tends to perpetuate its

* See Note, No. 4.

own quality of organisation, the nutritive action, however, being modified favourably or otherwise, according to the kind and degree of stimulation coming either from within or from the external world. Where muscular and visceral activity is strong and prevailing, as in the ruder states of society and in the lower type of modern individuals, there shall we find a similar character of nutrition and habit of body; and where the general expression of activity is more in the nervous functions, as among those possessing the type of our own times, there shall we find nutrition more distributed to the nervous part of the economy. Under the operation of this law are alone susceptible of being effected those physiological changes produced by civilization in the human type; and as in this process of civilization it is the office of the intellectual system to rise over the lower tastes and propensities, so in the process of bodily refinement, the nervous element of the organisation should bear predominating proportion over the muscular, visceral, and lymphatic.

XVI. In this manner did dietetic civilization (so to speak) first of all receive its incipient impulsion from the general progression of human

society, reacting, however, again in its turn indirectly through the physical organisation upon the latter, as we have just seen, by the operation of the laws of nutrition. It remains now only to trace civilization by the laws and procedure under which it takes place intellectually and physiologically within the interior of man, as an individual, according to the order of the psychological development of the faculties, and to refer its progressive phases therein to the same relation to organic conditions as has been already done with regard to mankind in their collective capacity. In the earliest stages of society, the human mind, like that of the infant, from many of its higher powers being shut up within a rudimental state, and from its lower volitions being in vigorous activity, necessarily possessed an incomplete and unbalanced constitution, and was consequently in itself an imperfect and inadequate instrument rightly to interpret all its own various and complicated relations with the outward world—to see them, in just proportion and shape, under the intellectual form of truth. The light became refracted too obliquely and obscurely in struggling through this turbid and discoloured medium. In examining,

accordingly, the products of the human mind at this early period, both as developed in ideas and in actions, we shall find but scanty traces of the existence and influence of the Moral Sense, or of Inductive Intellect, the two great keys to the moral and intellectual worlds. These elements lay yet quiescent, as it were, within their germ, and were not to be detected sensibly under general outward manifestation. For, the development of a lower grade of powers was then legitimately taking place, and occupied the mental field (as they should do) anteriorly in point of time. In proportion as the intellectual edifice became progressively built up, each part in its appointed order, both of place and of priority, so was man brought ever nearer to a fuller and more synthetical comprehension of the structure and activities of his nature. All his ideas of the outward world and of the relations of his existence had, therefore, at this time, the restricted character of his own individuality and imperfect type; they were oblique and rudimental. An uninformed and instinctive Mysticism acting in alliance with the lower perceptive intellect alone, interpreted in a natural, child-like manner all the phenomena of the objective world, and of

the internal consciousness, and giving of necessity to outward scenes and agencies the stamp and image of their own peculiar colour and character of activity, saw living personalities—the age of the gods (India, Egypt, Greece, Scandinavia, &c.)—intervene in the wonderful, and to them certainly inexplicable movements and effects, ever generated by the secondary causes of the very same creation, which still lies unchanged before us now, but more revealed in beauty and in truth. Hence divination and the sibyls amongst all the nations of antiquity, to interpret this mystic language of impersonated nature. The higher intellect, reflective reason, (except in extraordinary minds capable of esoteric thinking,) was then scarcely in existence. It could not have been an element, consequently, in the first crude and limited notions of human society, and is, in fact, not to be found in the different outward primeval expressions of the internal activity of the human mind—the sagas, myths, traditions, creeds, fables, &c., of infant nations. This fractional manner of interpreting the human and the intellectual worlds is a necessary reflected expression of the inferior order of mind, in all times and in all the family of mankind, and accords well in

every respect with the rudimental development of the nervous structures, as seen, in extreme cases, amongst savage tribes; and, but in a less degree, amongst the lower typed individuals of even civilized communities. The higher moral and intellectual truths were not yet able to be apprehended through a philosophic medium, but were transfused into the rudimental mind through a graduated scale of symbolic equivalents, whereby, under the form of gross and sensible images, intellectualities were, in an imperfect manner, brought down to sense. This impersonating tendency of the human mind, which, in the times of antiquity, was chiefly confined to the comparatively lower ranges of outward nature, in later times naturally transferred itself, with the progress of intellect, to more elevated ranges of being—the subjective states and verities of the moral world. But as the few great general laws which preside over the government of the human economy itself, and of its related creation, become more and more clearly apprehended by slow degrees, the symbolised structure of impersonation is necessarily superseded and left aside by the true intellectual interpretation—the *lumen siccum* of philosophy and science. *Felix qui potuit*

rerum cognoscere causas. Nature is no longer, as it were, a sealed book, but lies more transparent, and less clouded, less veiled to the eye. The moral and material universe still remains to us by no means disenchanted of its beauty and of its religion, but the mystic ground of things unknown is carried only a remove beyond its former boundary, and to a higher sphere, and a greater diameter and distance given thereby to the intellectual horizon, in whose centre stands the human subject. So that the point at which the dominion of wonder commences becomes a sure gauge of the extent of intellectual range and capacity. This recedence of what is unknown—the mystic world—before intellectual progress, is ever taking place within the interior of humanity. And these successive enlargements of the circle of humanised activity bear the same relation to the inward world that the diffusion of social civilization over greater and greater circles of geographical extent does to the outward. These various sagas, traditions, &c., then, of the different infant people, under the form of poetry and of art, must be regarded only as the outward manifestation of the first stir and expansion breaking forth from within the internal con-

sciousness of man—the incipient spontaneity of the transcendental faculties—the λογος—constituting the times coeval with the rudimental stage of humanity, and anterior to the first era of history; but with the progress of the internal physical and psychological development, there ever succeeded, simultaneously, an improved and more accurate appreciation of nature, in her laws and habitudes, constituting the long series of historical ages. It is the coalescence of continually increasing intellect with the moral and imaginative sentiments which constitutes the active element of progression. It is this which first elevated mankind from the stocks and stones of fetichism to the impersonated forms of paganism, and from these again to the lofty platform of Christianity—destined also, no doubt, in ages to come, as has heretofore occurred, to undergo a series of modified interpretations, and so greatly to transcend its present tone and condition —and it is the same element which has led them onwards from the instinctive and imperfect interpretations of wonder and superstition to the final demonstrations of philosophic truth. In tracing the steps of this intellectual progress through the different methods of inquiry, pursued by the human

mind, we shall find the latter taking their character entirely from the rank of faculties developed, these again being authentically reflected in their appropriated cerebral structures. Thus the very first method—*αυτοψιὰ*—consisted in the mere evidence of the senses—in the material vision of objects and phenomena, accompanied with the lowest possible provision of nervous organisation—a rudimental type yet exemplified in the wretched natives of the Australian continent, and in the stupid savages of South America, as described by Humboldt. In the next advancement, the human mind became equal to make use of, and understand the most obvious examples and comparisons as a substitute for reasoning, (Esop,)—a method more friendly to the capacity of a weak order of intellect, and more easily apprehended by it than the most faultless process of ratiocination, (Menenius Agrippa). A similar inferior cast of mental power abounds in all communities, and its corresponding physical characteristics will be found conformably expressed. Passing through the phases of mind represented by the seven sages of Greece, the method acquired in Hippocrates and in the dialectic school of Socrates a more philosophic form

under the influence of additional intellectual powers of the higher order; and now the first approach was made to the method by induction. As the accumulation of intellectual activity by this time had generally become realised in physiological development, this was the most brilliant period of Greek philosophy. Pythagoras and Plato established the method by synthesis, and soon afterwards succeeded the syllogism of Aristotle and the soritic method of Zeno. Similar to what took place in the earlier stages of social civilization, it cannot fail to be observed there obtained a partial and exclusive activity in all this course of intellectual effort to investigate truth; for the whole of the mental powers was by no means comprised within the constitution of any one of these several methods. Each employed those intellectual elements only which were agreeable to its own peculiar genius, to the exclusion of the rest; so that it will be found that no one method alone entirely absorbed the full volume and compass of the human mind. The internal progression had not yet arrived so far. From this time, indeed, a period of two thousand years was passed in unapparent fresh development—without further im-

provement upon the old methods of philosophising, when Bacon laid down, with deeply prophetic genius, on a broad and systematic basis, the most comprehensive method yet brought to act upon the difficulties and obstructions of human knowledge, and the most fruitful in benefits and constant progress to mankind. With induction, in an enlarged sense, both as to its method and its end, the mind entered into the last and fullest phase of the intellectual system. The "Novum Organon" ascends from sense, through intermediate elaborations, to the highest ranges of abstract intellectualities; it appreciates the qualities and phenomenal changes of all objective existences; it carries up their suggested and secondary relations to be compared in analogy, to be sifted in discriminative analysis, and to be generalised into universal truths by the apprehensive power of causality. Now only for the first time may the whole Intellectual Nervous System be said to have been authentically represented in all its integrity, in a method of philosophic inquiry. Through this circumstance alone, of possessing so perfect an intellectual instrument, have modern times transcended antiquity.

XVII. Having now considered the successive

developments of civilized activity as they took place in society in general, and in man as an individual, and having also noticed the physiological laws under whose operations all incremental nutrition in the constituent tissues of the body is distributed more abundantly to one part than to another according as certain habits predominate and differently characterise the many varieties of the human type in all stages of civilization, it now remains to speak of those changes and modifications produced *generally* throughout the organic constitution, by the progressive increase of nervous nutrition—an increase distinctly to be traced ascending from savage life through the various phases of man's physiological enhancement, up to the highest civilized type: and, besides, it will now be in its place to give a seat and order of appearance (as far as present knowledge extends) to those functions of the nervous system whose conditions of physical development correspond with the different steps of social and individual advancement. In the same manner as the comparative intellectual nervous system and physiological qualities of domestic animals (most markedly in the breed of dogs and horses) have been raised from the savage

type to their present delicacy and fineness of organisation by the sole influence and unwearied expenditure of human care and skill, in the course of innumerable generations, so also has there taken place, as the necessary reflected effect of civilization amongst all the more advanced nations, an analogous improvement in the proportion and quality of the constituent structures of which the human body is composed—an improvement as much enhancing the physiological value of man, as there is a difference between the dronish and coarse-limbed cart horse and the high-mettled and finely constructed racer, or as there is between the vulgar pretensions of a town hybrid, and the exquisite intelligence and aristocratic formation of the best bred dogs employed by the sportsman. To use a strong technical phrase, there is a quality of blood and of breeding, (physiologically speaking,) equally as much in man as in animals. And this is the result of long continued civilization as much in the one case as in the other. Many successive generations of favourable conditions must be passed through to arrive at the best quality of blood, and of organisation; to transform the gross succulent body of the peasant-woman to the fine-grained nervous

tissue of the high-bred lady. This difference of blood must ever make a broad physiological distinction between the different classes of society—as decided a distinction as the many social and conventional differences do. A similar progression in bodily refinement takes place at large amongst the most rising nations. The chief changes effected in the course of this physiological amelioration of the human type are the following:—those in the osseous system, where the bony structure, losing all excess of bulkiness and porosity, becomes denser, more compact, and more finely grained, gaining in strength and specific gravity what it loses in softness and clumsiness of size; in the muscular system, where the fibrous layers, losing their coarse and exaggerated development, become more delicate and subdued, and more closely knit together; in the visceral system, where the soft and spongy organs which subserve the first crude elaboration of the nutritive juices, shrinking up from repletion and corpulency, allow the abdominal cavity to retreat beneath the broad and projecting thorax; in the adipose and lymphatic systems, where the loose and pulpous tissues become absorbed under the dispersive influence of

increased vital activity; and, above all, in the nervous system at large, where, besides the amplified volume and enhanced temperament of the cerebral masses, (of which more hereafter,) the different structures of the body become interpenetrated with a more copious interlacement of nervous webbing, whereby all the complicated mechanism of animal and organic life is made to perform its various functions with more energy, more breadth, and more endurance.* In the great majority of individuals some only of these changes will be found to have been accomplished. It is a rare case to see them effected in all their integrity. But wherever these several changes have not taken

* One of the most remarkable results of modern civilization has been the extension of human life, as seen in the steadily decreasing ratio of mortality (proved by carefully compiled official statistic tables) amongst all advancing nations, and particularly our own. This extension of life has been found (as is well known) to take place *(cæteris paribus)* much more decidedly in cities and towns where the greatest amount of nervous energy is in action; where the individual is habitually immersed in the higher kinds of vital excitement consequent upon intellectual and political pursuits, and the free and unrestrained exercise of the different industrious activities invariably resulting from, and likewise conducing to, an enhanced character of physical organisation—the nervous type of temperament.

place, the individual in his physical organisation remains fixed at a corresponding distance from that unblemished physiological standard of proportion and beauty, which it is the nature of civilization to develop. Most individuals contain within themselves some fault of formation illustrating this truth. And on the other hand, wherever any of the more influential vital actions have been, for a series of generations, or even a less period, too exclusively educated to act, or too much refined upon, to the prejudice of the rest, by a vicious, or one-sided indulgence in the ways and habits of civilized life, the consequences will be equally apparent in the impoverished or imperfect development of some related system in the economy; as, for example, the frequent occurrence in the present day of the large brains and highly-wrought nervous systems, accompanied with inadequate development of the assimilative, vascular, and muscular systems, in children too finely bred from excessive delicacy of organic temperament on the side of one or both parents. To investigate these two classes of abnormal states comes more properly within the province of the philosophic physician. In the different systems, enumerated above, may be said to re-

side more or less perfectly the different temperaments of the human body—the fibrous or bilious, the vascular or sanguine, the lymphatic, and the nervous. These temperaments more commonly than generally supposed, as well as the different elemental tissues and systems of the body, will be found unequally distributed throughout the same individual, some parts of the body possessing the normal proportion of a particular temperament tissue, or system, whilst the others do not. Such irregularities may be almost always traced to organic causes residing within the constitution of the immediate parents, or to peculiarities in one or other of the families from which the individual may happen to be descended.* A numerous class having this unequal distribution is characterised by the head being powerfully organised and richly suffused with nervous influence, performing with ease a more than ordinary extent and load of mental labour, whilst the trunk and abdominal system, voluminous beyond proportion, are remarkable for adipose depositions and lymphatic obstructions—a class containing frequently amongst its members, authors,

*Vide Notes 2 and 3.

men of science, orators, and politicians,* and, generally speaking, all those individuals falling under the well-known definition "active in mind, indolent in body." Another example of this inequality of structural distribution is observed where, in a fine nervous temperament, the glandular and absorbent system presents evidence in some parts of the body of a strumous diathesis; and another, where we find an active vascular organisation giving habitual floridness to the complexion of the face and head, whilst the circulation in the capillary tissue of the extremities is in such poor endowment as scarcely to suffice for the adequate generation of heat. The osseous, muscular, and other systems have very commonly also their examples of unequal development throughout the different parts of the same individual.

XVIII. Besides the evidence accumulated in Comparative Anatomy from a certain uniformity of physiological design, and analogy of structure pervading the lower scale of the nervous system in animals, as well as from the manner in which this system becomes evolved out of its embryotic stage in fœtal

* Dr. Samuel Johnson, Sir John Leslie, Majendie, Fox, Pozzo di Borgo, &c., &c.

life to its completed growth in adult age, on taking a most extensive survey of the development of the cerebral masses in the types of all the savage and less civilized nations of the earth, and on comparing also the volume, quality, and proportion of these masses belonging to the lower-typed individuals of even civilized communities, with those possessing the more perfect intellectual type of high civilization, it cannot fail to strike every one (qualified for the purpose by the proper knowledge and mental capacity) that there exist between these two extremes most appalling differences of physiological development in the cerebral masses; and to those more technically instructed, there will likewise present themselves a series of intermediate differences all along the ascending gradations of the physiological scale. These intermediate differences, once specified in a certain order and detailed form, would be rendered capable of being compared, stage by stage, with the corresponding scale of civilization historically appreciated. The physiological and historical evidence of civilization would thus be placed side by side. It has now indeed been fully established by the researches of modern physiologists, that the visceral ganglionic system, the medul-

lary columns of the spinalchord, the annular protuberances, and other cerebral ganglionic expansions, together with the numerous complex formations at the base of the brain; that the turgid mass of the middle lobes, the cerebellum, and posterior lobes, with but a rudimental expression of the anterior ones, and of the upper convolutions of the hemispheres, (deficient, either absolutely or relatively, to the rest,) are those parts of the nervous system, which, subserving muscular and animal activity, predominate and characterise the lower exemplar of type. In the same manner, too, as those parts of the nervous system which were deficient in the lower type, form the very characteristics of the higher, so also the characteristics of the former are wanting, absolutely or relatively, in the latter. So that those additional extensions of the nervous system, having relation to the higher attributes of humanity, which in the lower type are, for the most part, wanting or very faintly expressed, in the higher one, on the contrary, rise out in external form to fill up both the coronal vault transversely encircling the broad and elevated forehead, and likewise the arch which spans upwards over the elliptic diameter of the head, affording physiognomical evidence of that

internal amplification of development which ever attends the corporeal organisation of genius and of moral and intellectual excellence.*

XIX. From the preceding pages it will be seen how wanting and inconclusive the Philosophy of History must ever be, if considered (as has heretofore been the case) independently of the physiological element. Without this no satisfactory solution of its many all-important problems can be arrived at,—every stage of progressive amelioration having invariably a material representation in the nervous organisa-

* The parts of the nervous system which attain their highest development in the human species, and may, from that circumstance, be supposed to be especially connected with those mental operations in which the pre-eminence of the human species consists, are, the Convolutions of the Brain and Cerebellum, the Corpus Callosum, Corpora Striata, Thalami and Tuber Annulare. Those which are least developed in the human species, but are proportioned to each other in the different classes of vertebrated animals, and may therefore be presumed to be chiefly connected with sensations and voluntary motion, and to have less connexion with any strictly intellectual acts, are the Spinal Chord, Corpora Quadrigemina, (called Optic Lobes in many of the lower animals,) and Vermiform Processes of the Cerebellum. The Fornix, and Pes Hippocampi attain their highest development in some of the Mammalia, but not in man.—*Outlines of Physiology by Professor Alison of the University of Edinburgh*, pp. 305.

tion. There are, indeed, written within us, in living characters, the civilization of a thousand years, which, when deciphered by a proper physiological analysis, may be made to disclose the whole history of the successive changes effected in the physical man, and, above all, to point out the way, by induction, to the historical demonstration of God's Providence in the design and conduct of humanity. Out of this element alone can be obtained our chief means of estimating the character and powers of different nations and races, according to their political, moral, and intellectual capacity. It teaches us how unconquerably slow must ever be the progressive stages of civilization, and that they must extend throughout centuries of time; no great permanent change in national or individual character taking place, without additional nutrition, and a certain related development in the nervous masses. These higher philosophical questions, however, of History and Political Science, are better left to their respective writers; they are here subservient only to the chief end of this introductory Essay—the physiological appreciation of the quality, and constituent proportions of organisation in man, as produced by civilization, and how much this know-

ledge ought to influence the principles of Medical Science in estimating the many modifications and pathological states which present themselves in the higher type of individuals in our present times.

NOTES.

Note 1.

Of all modern nations, the English, more perhaps than any other, have a greater and more proportionate admixture of the best races. Upon the original Celtic stock there was first engrafted the Roman civilization; after awhile, came the frequent emigrations of the Saxon tribes; and, lastly, the national character received its full accession of strength and impulse from the flower of the famous Scandinavian races in the Norman invasion and settlement. It was the union of the two great elements of modern civilization, the Roman and the Germanic; the one giving us our municipal institutions and government, the other our sense of individual liberty and independence. It is remarkable, that where these new elements did not penetrate, civilization has remained almost stationary, or at best, very backwards, as in Wales, the Highlands of Scotland, and, indeed, in many localities in England itself. In Ireland, above all, there is a striking contrast between the semi-barbarism of the countries where the old Celtic races remained uncrossed by foreign blood, and between the flourishing condition of the districts colonised by those of Scotch and English extraction, as fully exemplified in the difference of social

progress made by the Southern and Northern populations of the island. In France, also, where there took place a copious intermixture of the Frank and Germanic races with the old inhabitants, as in its northern provinces, the intelligence, the physiological value, and social condition of the population is much higher than in those parts where the Celtic races have remained pure and unmixed, as in Brittany, Auvergne, and many other departments of the kingdom. Even Germany, inhabited as it is by a race ranking the highest in native intellectual and moral qualities, suffers from exclusion of proper foreign intermixture, and develops its civilization with less freedom and success than more favoured nations. In addition to these examples it would not be difficult to adduce many others, scattered throughout the European and Asiatic continents, particularly amongst the Sclavonic races. The stationary civilization of the exclusive Chinese and Turkish nations (at least until very lately) are, however, too striking examples to be passed over in complete silence.

Note 2.

It is astonishing what little consideration is given by society at large to a proper estimation of the physiological qualifications which ought to guide individuals in their inter-marriages; particularly so, when we reflect that the whole character of their descendants is involved, according to the quality of blood and the type of nervous system hereditarily transmitted from the combined influence of the parents themselves, their families, and the races to which they belong. Some of the more glaring effects of

the grosser vices of conformation are indeed recognised, and condemned, such as mania, scrofula, phthisis, &c.—the lowest on the scale ; but of the less obvious imperfections little account is taken, although they too, as far as they go, have an important influence. In like manner, it is but little impressed upon the minds of society that the more perfect types of conformation have a strong tendency (unless accidentally crossed) to perpetuate themselves hereditarily; and that to enhance the best qualities of bodily organisation, and of the mental powers, in a family, a serious and calculated attention should be paid to the physiological value of the individual who is to be a party to the alliance. This ignorance becomes more astonishing as the practice followed is greatly different with regard to the races of domestic animals. From the extraordinary judgment and perseverance shown *here*, determinate modifications can be produced, both of structure and of disposition, with an approach to mathematical precision that is truly wonderful. It is needless to repeat, the same physiological laws obtain in the economies both of man and of animals. If two individuals form an alliance, each of a weak and lymphatic habit of body, their resulting family will have the *same* habit transmitted, and in a much more aggravated degree; so also if an alliance be made between two individuals possessing each an irritable nervous organisation, their offspring will be found still more strongly afflicted with the *same* character of excessive endowment. In short, any great organic imperfection in the different systems and structures of the body, will (except in cases where counteracting conditions have been brought to operate) be more or less reflected hereditarily upon the

descending generations. There is no escaping from these laws. With such knowledge before our eyes, it behoves us well to consider it of no slight importance, with whom, and with what family, alliances by marriage are made, as assuredly, the physical and mental qualities of the children are compounds, more or less perfect, of the aggregate qualities residing in the parents and the cognate races. Many apparent exceptions will perhaps be found to this rule, but when it is recollected how much in every one the bodily and mental activities vary, and become differently combined, in the course of a life, in obedience to surrounding influences and the habits compelled by social position, (and it is these different states that virtually represent the character of the individual for the time being,) it will not be difficult to understand how these several modifications in one or both parents should correspondingly reflect themselves, upon those of their offspring, whose initial era of intra-uterine existence might happen to take place under such times and circumstances; and in this way to give rise to that variety and even oppositeness of talent and of character which so frequently pervades children of the same parents. The physiological principle to be followed, therefore, by individuals is, to ally themselves, by preference, with those only who possess, in a characteristic manner, the elements wanting in their own case, in order that, with the common sum of both parents, all the elements of the human constitution be fairly represented. To carry out into general practice the organic laws, just now laid down throughout the many varieties of constitution that occur amongst society, requires no common knowledge of the structure and physiology of the human frame. It is good, however, to

know that such knowledge does exist; and as the outward characteristics of the different temperaments and constituent elements are appreciable, without difficulty, with proper study and instruction, it comes within the power of individuals interested, (and who is not?) to possess, if not the whole, at least an essential part, of the necessary information. They will then learn there is as much natural difference between the various qualities of blood and of organisation in the human species as there is between the finest porcelain and the coarsest potters' clay; and from the physiological laws presiding over hereditary transmission, they will be made aware that either the one or the other (as the case may be) will enter into the organisation of their descendants.

Note 3.

Another subject of importance in this department of physiology is the influence of the constitution and habits of parents on their offspring.

That the stature, complexion, forms of feature and limbs, &c., as well as the mental peculiarities of the offspring, frequently bear a strong resemblance to those of the parents, is matter of familiar observation;—it is certain also, that resemblances in these respects are observed nearly indiscriminately to both parents;—and it has often been noticed that such peculiarities have passed over one generation, and appeared in the next. Peculiarities of formation, such as supernumerary fingers or toes, have in like manner often been hereditary in families, sometimes descending by the females and sometimes by the males, and yet been found

only in a certain number of the members of these families. In like manner, longevity is very often observed to be hereditary; and it is therefore quite in conformity with other ascertained facts, that we find the tendency to certain diseases, particularly to asthma, gout, mania, and the various forms of disease which are ranked together under the term scrofula, to be much greater in some families than in others; although in many cases it is only by the action of well-marked exciting causes that such diseases, even in persons so predisposed to them by hereditary constitution, are produced.—*Page* 399.

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The acquired habits and mode of life of parents, have likewise a very important influence, which is well ascertained on a large scale, but cannnot be easily demonstrated by individual instances, on the character of the vital actions which their offspring will exhibit. In so far as the mode of life of parents is permanently debilitating, and disposes them to scrofulous disease, it is certain that it will generally give a similar tendency to their progeny; as is evident on comparing the amount of scrofulous disease in the young children of a great town, with its amount in the previous generations of the same families, if engaged in agricultural employments. The effect of habits of parents on the vital actions of their offspring is well illustrated by the great variety of appearances assumed by animals when domesticated, and their return, in the course of a few generations, in a state of nature to a single and uniform type.

But a more singular fact, which appears well ascertained in regard to certain animals, (dogs and horses,) and pro-

bably in regard to the human species also, is the transmission, to the second and third generation, of habits not natural to the animal, but acquired by education and training. —*Outlines of Physiology by Professor Alison of the University of Edinburgh*, pp. 401.

Note 4.

The wisdom of Providence is in no instance more conspicuous than in adjusting the constitution of man to his external circumstances. Food is extremely precarious in the hunter-state; sometimes superabounding, with little fatigue, sometimes failing, after great fatigue. A savage, like other animals of prey, has a stomach adjusted to that variety. He can bear a long fast; and gorges voraciously when he has plenty, without being the worse for it. Whence it is, that barbarians, who have scarce any sense of decency, are great and gross feeders. They are equally addicted to drunkenness, and peculiarly fond of spirituous liquors. Drinking was a fashionable vice in Greece, when Menander, Philemon, and Dephilus wrote, if we can rely on the translations or imitations of those writers by Plautus and Terence. Diodorus Siculus reports, that in his time the Gauls, like other barbarians, were much addicted to drinking. The ancient Scandinavians, who, like other savages, were intemperate in eating and drinking, swallowed large cups to their gods, and to such of their countrymen as had fallen bravely in battle. We learn from the 25th fable of the Edda, which was their sacred book, that to hold much liquor was reputed heroic virtue. Contarini, the Venetian am-

bassador, who wrote Anno 1473, says, that the Russians were abandoned to drunkenness; and that the whole race would have been extirpated, had not strong liquors been discharged by the sovereign. The Kamschatkans love fat; and a man entertains his guests by cramming into their mouths fat slices of a seal, or a whale, cutting off with his knife what hangs out..... William of Malmsbury, who wrote in the days of Henry II., says, "That the English were universally addicted to drunkenness, continuing over their cups day and night, keeping open house, and spending the income of their estates in riotous feasts, where eating and drinking were carried to excess, without any elegance." People who live in a corner imagine that every thing is peculiar to themselves: what Malmsbury says of the English is common to all nations, in advancing from the selfishness of savages to a relish for society, but who have not yet learned to bridle their appetites..... Of old, there was much eating, with little variety; at present, there is great variety, with more moderation. From a household-book of the Earl of Northumberland, in the reign of Henry VIII., it appears, that his family, during winter, fed mostly on salt meat and salt fish; and with that view there was an appointment of 160 gallons of mustard. On flesh-days, through the year, breakfast for my lord and lady was a loaf of bread, two manchets, a quart of beer, a quart of wine, half a chine of mutton, or a chine of beef, boiled. On meagre days, a loaf of bread, two manchets, a quart of beer, a quart of wine, a dish of butter, a piece of salt fish, or a dish of buttered eggs. During lent, a loaf of bread, two manchets, a quart of beer, a quart of wine, two pieces of salt fish, six baconed

herrings, four white herrings, or a dish of sproits. There was as little variety in the other meals, except on festival-days. That way of living was at the time high luxury : a lady's waiting-maid at present would never have done with grumbling at such a table. We learn from the same book, that the Earl had but two cooks for dressing victuals to more than two hundred domestics. In those days, chicken, capon, pigeon, plover, and partridge were reckoned such delicacies as to be prohibited, except at my lord's table....

Barbarous nations, being great eaters, are fond of large joints of meat ; and love of show retains great joints in fashion, even after meals become more moderate : a wild boar was roasted whole for a supper-dish to Antony and Cleopatra ; and when stuffed with poultry and wild fowl it was a favourite dish at Rome, termed the *Trojan boar*, in allusion to the Trojan horse. The hospitality of the Anglo Saxons was sometimes exerted in roasting an ox whole. Great joints are left off gradually, as people become more and more delicate in eating. In France, great joints are less in use than formerly ; and in England, the voluminous surloin of roast beef, formerly the pride of the nation, is now, in polite families, delegated to the side-board. In China, where manners are carried to a high degree of refinement, dishes are composed entirely of minced meat. In early times people were no less plain in their houses than in their food. Toward the end of the sixteenth century, when Hollinshed wrote, the people of England were beginning to build with brick and stone. Formerly houses were made of posts wattled together, and plastered with clay to keep out the cold ; the roof was straw, sedge, or reed. It was an observation of a Spaniard,

in Queen Mary's days, "These English have their houses of sticks and dirt, but they fare as well as the king." Hollinshed, mentioning multitudes of chimneys lately erected, observes, upon the authority of some old men, that in their younger days there were not above two or three, if so many, in most uplandish towns of the realm, religious houses and manor-places of their lords excepted ; but that each made his fire against a rere-dosse in the hall, where he dined, and dressed his meat. From Lord Northumberland's household-book it would seem that grates were unknown at that time, and that they burnt their coal upon the hearth : a certain sum is allotted for purchasing wood, because, says the book, coals will not burn without it. There is also a certain sum allotted for purchasing charcoal, that the smoke of the seacoal might not hurt the arras.

In the fourteenth century the houses of private persons in Paris, as well as in London, were of wood. The streets of Paris not being paved, were covered with mud ; and yet for a woman to travel those streets in a cart was held an article of luxury, and as such prohibited by Philip the Fair. Paris is enlarged two-thirds since the death of Henry IV., though at that time it was perhaps not much less populous than at present. They were equally plain in their household furniture. While money was scarce, servants got land instead of wages. An old tenure in England binds the vassal to find straw for the king's bed, and hay for his horse. From Lord Northumberland's household-book, mentioned above, it appears, that the linen allowed for a whole year amounted to no more than seventy ells ; of which there were to be eight table-cloths

(no napkins) for his lordship's table, and two towels for washing his face and hands. Pewter vessels were prohibited to be hired, except on Christmas, Easter, St. George's day, and Whitsunday. Hollinshed mentions his conversing with old men who remarked many alterations in England within their remembrance ; that their fathers, and they themselves, formerly, had nothing to sleep on but a straw pallet, with a log of timber for a pillow ; a pillow, said they, being thought meet only for a woman in child-bed ; and that if a man in seven years after marriage could purchase a flock bed, and a sack of chaff to rest his head upon, he thought himself as well lodged as the lord of the town ; who, peradventure, lay seldom on a bed entirely of feathers. Another thing they remarked was, change of household vessels from timber plates into pewter, and from wooden spoons into tin or silver.—Lord Kames, Book 1, Sketch viii.—*Progress and Effects of Luxury.*

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